IEEE P802.11  
Wireless LANs

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| |  |  |  |  |  | | --- | --- | --- | --- | --- | | SA2 CIDs 5009, 5010, 5011 | | | | | | Date: 2020-09-14 | | | | | | Author(s): | | | | | | Name | Affiliation | Address | Phone | email | | Youhan Kim | Qualcomm |  |  | youhank@qti.qualcomm.com | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |

Abstract

This submission proposes resolutions for the following comments from the SA ballot 2 on P802.11-REVmd D4.0:

5009, 5010, 5011

NOTE – Set the Track Changes Viewing Option in the MS Word to “All Markup” to clearly see the proposed text edits.

**Revision History:**

R0: Initial version.

# CID 5009, 5010, 5011

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| --- | --- | --- | --- | --- |
| **CID** | **Clause** | **Page.Line** | **Comment** | **Proposed Change** |
| 5009 | 21.3.18.5.3 | 3236.18 | "The start of a 20 MHz VHT PPDU in the primary 20 MHz channel at or above –82 dBm."  The VHT STA supporting a reception of a 40 MHz, 80 MHz, 160 MHz, or 80+80 MHz VHT PPDU can operating in a 20 MHz operation mode. The condition does not cover this case. | Change as follows:  "The start of a 20 MHz, 40 MHz, 80 MHz, 160 MHz, or 80+80 MHz VHT PPDU in the primary 20 MHz channel at or above –82 dBm." |
| 5010 | 21.3.18.5.3 | 3236.21 | "The start of a 40 MHz non-HT duplicate or VHT PPDU in the primary 40 MHz channel at or above –79 dBm." The VHT STA supporting a reception of an 80 MHz, 160 MHz, or 80+80 MHz VHT PPDU can operating in a 40 MHz operation mode. The condition does not cover this case. | Change as follows: "The start of a 40 MHz, 80 MHz, 160 MHz, or 80+80 MHz non-HT duplicate or VHT PPDU in the primary 40 MHz channel at or above –79 dBm." |
| 5011 | 21.3.18.5.3 | 3236.26 | "The start of an 80 MHz non-HT duplicate or VHT PPDU in the primary 80 MHz channel at or above –76 dBm." The VHT STA supporting a reception of an 160 MHz, or 80+80 MHz VHT PPDU can operating in an 80 MHz operation mode. The condition does not cover this case. | Change as follows: "The start of an 80 MHz, 160 MHz, or 80+80 MHz non-HT duplicate or VHT PPDU in the primary 80 MHz channel at or above –76 dBm." |

**Background**

D4.0 P3235-3236

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| 21.3.18.5.3 CCA sensitivity for signals occupying the primary 20 MHz channel  The PHY shall issue a PHY-CCA.indication(BUSY, {primary}) primitive if one of the conditions listed in Table 21-27 (Conditions for CCA BUSY on the primary 20 MHz) is met in an otherwise idle 20 MHz, 40 MHz, 80 MHz, 160 MHz, or 80+80 MHz operating channel width. With >90% probability, the PHY shall detect the start of a PPDU that occupies at least the primary 20 MHz channel under the conditions listed in Table 21-27 (Conditions for CCA BUSY on the primary 20 MHz) within a period of aCCATime (see 21.4.4 (VHT PHY)) and hold the CCA signal busy (PHY-CCA.indication(BUSY, channel-list) primitive) for the duration of the PPDU.   |  |  | | --- | --- | | Table 21-27 Conditions for CCA BUSY on the primary 20 MHz | | | Operating channel width | Conditions | | 20 MHz, 40 MHz, 80 MHz, 160 MHz, or 80+80 MHz | The start of a 20 MHz NON\_HT PPDU in the primary 20 MHz channel as defined in 17.3.10.6 (CCA requirements).  The start of an HT PPDU under the conditions defined in 19.3.19.5 (CCA sensitivity).  The start of a 20 MHz VHT PPDU in the primary 20 MHz channel at or  above –82 dBm. | | 40 MHz, 80 MHz, 160 MHz, or 80+80 MHz | The start of a 40 MHz non-HT duplicate or VHT PPDU in the primary 40 MHz channel at or above –79 dBm.  The start of an HT PPDU under the conditions defined in 19.3.19.5 (CCA sensitivity). | | 80 MHz, 160 MHz, or 80+80 MHz | The start of an 80 MHz non-HT duplicate or VHT PPDU in the primary 80 MHz channel at or above –76 dBm. | | 160 MHz or 80+80 MHz | The start of a 160 MHz or 80+80 MHz non-HT duplicate or VHT PPDU at or above –73 dBm. |   The receiver shall issue a PHY-CCA.indication(BUSY, {primary}) primitive for any signal that exceeds a threshold equal to 20 dB above the minimum modulation and coding rate sensitivity (–82 + 20 = –62 dBm) in the primary 20 MHz channel within a period of aCCATime after the signal arrives at the receiver’s antenna(s); then the receiver shall not issue a PHY-CCA.indication(BUSY,{secondary}), PHY-CCA.indication(BUSY,{secondary40}), PHY-CCA.indication(BUSY,{secondary80}), or PHY-CCA.indication(IDLE) primitive while the threshold continues to be exceeded. |

**Proposed Resolution: CIDs 5009, 5010, 5011**

**Revised**.

**Note to Commenter:**

The main point the commenter is making is that a STA in a X1 MHz operating mode needs to be able to detect the start of PPDUs with X2 MHz bandwidth, including cases where X2 > X1. For example, a STA in 80 MHz operating mode needs to be able to detect the start of a 160 MHz PPDU and defer appropriately, even though the 80 MHz operating STA will not be able to demodulate the data portion of the 160 MHz PPDU. And Table 21-27 does not capture this point.

Furthermore, Table 21-27 as currently written is not easy to understand. For example, does the row “The start of a 160 MHz or 80+80 MHz non-HT duplicate or VHT PPDU at or above –73 dBm.” mean that a VHT receiver must measure the preamble power over 160 MHz, and run the preamble detector over 160 MHz? The intention of that row was that even for 160 MHz PPDUs, if you see energy in the primary 20 MHz greater than or equal to -82 dBm (the requirement for 20 MHz VHT PPDU detection), then you need to detect those 160 MHz PPDUs as well. And assuming flat power spectral density, -82 dBm in primary 20 MHz translates to -73 dBm over 160 MHz – hence the limit of -73 dBm in the last row of Table 21-27.

Instruction to Editor below updates the text such that it states directly that start of PPDUs needed to be detected regardless of the PPDU bandwidth if the power measured within the primary 20 MHz is at or above -82 dBm.

**Instruction to Editor:**

Implement the proposed text updates for CIDs 5009, 5010, 5011 in <https://mentor.ieee.org/802.11/dcn/20/11-20-1475-00-000m-sa2-cids-5009-5010-5011.docx>

**Proposed Text Updates: CIDs 5009, 5010, 5011**

*Instruction to Editor: Update D4.0 P3235L63 as shown below.*

21.3.18.5.3 CCA sensitivity for signals occupying the primary 20 MHz channel

A VHT STA with a *W* MHz operating channel width shall detect, with >90% probability, the start of a PPDU that occupies at least the primary 20 MHz channel in an otherwise idle *W* MHz operating channel width, and issue a PHY-CCA.indication(BUSY, {primary}) primitive within a period of aCCATime (see 21.4.4 (VHT PHY)) if one of the following conditions is met:

* The start of a non-HT PPDU as defined in 17.3.10.6 (CCA requirements).
* The start of an HT PPDU as defined in 19.3.19.5 (CCA sensitivity).
* The start of a non-HT duplicate or VHT PPDU for which the power measured within the primary 20 MHz channel is at or above –82 dBm.

The CCA signal shall be held busy (PHY-CCA.indication(BUSY, {primary}) primitive) for the duration of the PPDU.



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